SCIENCE AND INNOVATION IN THE SAN FRANCISCO BAY AREA

By Christian Simm

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Scientific and industrial developments in and around San Francisco really started to receive widespread public attention after the peninsula stretching south of the city was named "Silicon Valley" in 1971 by Dan Hoefler, a reporter for *Electronic News* writing a story on the semi-conductor industry in the region. This is why the Silicon Valley, and by extension the San Francisco Bay Area, is often considered as a unique example of a region with no prior industrial history which could make a direct leap to a leading edge high technology economy, just by having the right mix of talents, entrepreneurial spirit, prestigious universities, financial knowledge ... and climate. But there is more to it!

The Bay Area is a unique example of an interactive entity. Various authors alternatively describe it as an "incubator region", a region having a "social structure of innovation", or even an "ecosystem" consisting of interdependent institutions, social norms, and communities that create an environment encouraging the evolution of existing firms and, especially, the creation of new firms. In this "ecosystem" human resources are constantly recycled of as older firms stagnate, lose top talent, and even fail. Failure is not anymore a dead-end, it is a learning process, a distributor of knowledge and knowledge workers, a seed for new ventures. It is this "right" to experiment that has driven and still drives some of the best scientists, engineers, business people, lawyers, investors, etc. to San Francisco and its surroundings.

Let's examine some of the main actors and technologies which shaped the San Francisco Bay Area into a hotbed for innovation.

University of California, Berkeley

The roots of the University of California go back to the gold rush days of 1849, when the drafters of the State Constitution, a group of vigorous and farsighted people, required the legislature to "encourage by all suitable means the promotion of intellectual, scientific, moral and agricultural improvement" of the people of California. These early planners dreamed of a university which eventually, "if properly organized and conducted, would contribute even more than California's gold to the glory and happiness of advancing generations."

The university that was born nearly 20 years later, on March 23, 1868 was the product of a merger between the College of California (a private institution) and the Agricultural, Mining, and Mechanical Arts College (a land grant institution). The new university used the former College of California's buildings in Oakland until South Hall and North Hall were completed on the Berkeley site (South Hall is still standing), and in September 1873 the University, with an enrollment of 191 students, moved to Berkeley.

At the turn of the 19th century Phoebe Apperson Hearst, one of the University's most generous benefactors, conceived of and financed an international competition for campus

architectural plans that, she stipulated, "should be worthy of the great University whose material home they are to provide for". The University grew with the rapidly expanding population of California and responded to the educational needs of the developing state. In the early 1900s the University's new College of Commerce (now the Haas School of Business) trained students for export trade with the Orient and funneled graduates into industries and businesses throughout the state. During the same period a foreign service training program was developed in response to State Department concern about the poor quality of consular personnel.

In the 1930s research on campus burgeoned in nuclear physics, chemistry, and biology, leading to the development of the first cyclotron by Ernest O. Lawrence, the isolation of the human polio virus, and the discovery of all the artificial elements heavier than uranium. Eighteen members of the Berkeley faculty have been awarded Nobel Prizes for these and subsequent discoveries, as well as in literature and economics, for liberal arts kept pace with physical sciences. In 1966 Berkeley was recognized by the American Council on Education as "the best balanced distinguished university in the country". In the 2005 USNews ranking of America's best colleges UC Berkeley was selected as best public national university.

Stanford University

A story of Stanford, the university, is not complete without a history of Stanford, the man. Leland Stanford was a lawyer from Albany, New York, whose pioneer spirit made him join his five brothers in their mercantile business in the gold fields of California. There, Stanford prospered. In three years he bought out the Stanford Brothers' store in Sacramento. He became the most active member of a small group organizing the Republican Party in California, was eventually nominated governor in 1861, and was to be elected to the U.S. Senate in 1885.

Together with Collis P. Huntington, Mark Hopkins and Charles Crocker, Leland Stanford played a decisive role in having the first transcontinental railroad built.
The so-called "Big Four" took the high-stakes gamble and formed the Central Pacific Railroad company to lay track eastward to connect with the westward-building Union Pacific. A few days after May 10, 1869, when for the first time trains of the two railroads drew together at Promontory, Utah, the Stanfords' only child, Leland, celebrated his first birthday.

Young Leland loved the life on the Palo Alto Stock Farm purchased by his parents in 1876, which would later become the site of Stanford University. He was bright, spoke French fluently and, on trips to Europe with his parents, developed his passion for collecting in art and archaeology. The family was in Italy in 1884 when Leland contracted typhoid fever. He was thought to be recovering, but on March 13, Leland's promising young life came to an end, two months before his 16th birthday. Stanford, who had remained at Leland's bedside continuously, fell into a troubled sleep the morning the boy died. When he awakened he turned to his wife and said : "The children of California shall be our children". These words were the real beginning of Stanford University.

When the Stanfords returned to America they settled on creating a great university, one that, from the outset, was untraditional: co-educational, in a time when most were all-male; non-denominational, when most were associated with a religious organization; avowedly practical,

producing "cultured and useful citizens" when most were concerned only with the former. When Stanford University opened its doors on October 1, 1891, after six years of planning and building, about 250 students were initially expected. But the first student body consisted of 559 men and women, and the original faculty of 15, seven of them originally from Cornell University.

In 1898, five years after the death of her husband, Mrs. Stanford turned over $11 million to the university trustees, being eager to see constructed during her lifetime the rest of the buildings that she and Senator Stanford had planned. The Stanford's land-endowment of over 8'000 acres is, by decree in their Founding Grant, never to be sold.

Today, Stanford has around 1'800 tenure-line faculty, senior fellows and center fellows, as well as an estimated 170'000 living degree holders. Twenty-five Stanford faculty have won the Nobel Prize since the university's founding. Famous companies like Hewlett-Packard, Yahoo!, and Sun Microsystems are spin-offs of Stanford university.

The spark-based radio telegraph

Silicon Valley started with the early radio system technologies, well before the "silicon age". In 1908, a Stanford graduate named Cyril Elwell was working in Palo Alto on a so-called spark-based radio telegraph system. Being unable to get the system to work he traveled to Denmark to acquire the arc transmitter technology developed by Vladimir Poulsen. Back in Palo Alto, Elwell turned to the president of Stanford and the head of its Civil Engineering Department to finance a new company to provide wireless telephone and telegraph services on the Pacific Coast using the Poulsen technology : the soon to be named Federal Telegraph Company (FTC). This was notably the first heavy involvement of the university's administration and faculty in the formation of a new company.

When the United States entered World War I, the entire radio industry was nationalized. FTC received orders for three hundred 2kW shipboard transmitters from the Navy. Orders for more shore stations flooded in. Employment at FTC surged from 30 to 300, and the war work culminated with the installation of a pair of 1'000kW transmitters southwest of Bordeaux, France.

The vacuum tube

Spark-based systems emitted strong harmonic radio frequencies that interfered with smaller stations. This posed real problems as transmitters became more and more powerful. For some time, the use of alternators emitting no harmonics and broadcasting on a sharply defined frequency seemed to be the solution. But soon a better technology would replace them too.

In 1910, a Yale PhD in electrical engineering named Lee de Forest came to San Francisco to supervise the installation of wireless telegraph sets on two army transport ships. The receivers used a vacuum tube, the "audion", that de Forest had patented in 1907. Lee de Forest was hired by FTC and provided with a laboratory, two assistants, and free rein to develop his ideas. By 1912, de Forest had developed vacuum tubes that could be applied to

all three stages of wireless radio communications : the signal generation, reception and amplification. The three-element vacuum tube, which became known as the "telephone repeater", was absolutely crucial to the development of the nascent electronics industry. De Forest, characteristically impatient and therefore without proper due diligence about the anonymous buyer, sold not only the technological developments, but also his 1907 patent to AT&T.

The Electronic Television

Until the 1920s, the television systems under development had used a mechanical scanning disk to translate images into electronic impulses. In 1924, at the age of 14, an inventive prodigy in Utah named Philo Farnsworth combined the concepts of the photocell (for the camera) to the cathode ray tube (for the picture tube), thereby conceiving a full-blown system for the electronic television. When lacking the money to build a prototype, Farnsworth moved to San Francisco in 1926 where he not only received seed money but also was put in touch with the right people to pursue his research. These included Frederick Terman from Stanford University, Bill Cummings from UC Berkeley, and Russell Varian who worked with Farnsworth for four years before going on the found Varian Associates with his brother.

Farnsworth achieved the first all-electronics transmission of a television image in 1927. Three years later he was able to win a solid patent on the system, which even obliged the giant company RCA - often mistaken as the inventor of the electronic television - to pay him royalties. In 1931, Farnsworth's television system had been perfected to the point where commercial production seemed feasible. This is when the San Francisco backers, eager to see some return on investment, sold the company to Philco, then the largest home radio manufacturer in the United States.

The airborne radar antenna

While a high school student, Tim Moseley was the foreman of the school's machine shop. In 1921, at the age of nineteen, his established his own machine shop in San Francisco, the Dalmo Manufacturing Company. There he often improved on the designs he was given by his customers, was soon inventing his own products, and hired immigrant Russian PhD research engineer Alexander Poniatoff. In 1944 and although they knew nothing about radars, they participated in a bid to build a prototype airborne radar antenna for the Navy, worked for hundred days without a break, often sleeping in the shop ... and won the contract ahead of companies like Westinghouse and General Electric.

Westinghouse offered to manage the high-volume production, and the joint Dalmo-Victor joint venture was set up. By the end of World War II, this company had emerged as the leading manufacturer of airborne radar antennas. By 1966 it was also producing 90% of the nation's submarine antennas and was building antenna systems for NASA's lunar missions.

Moseley's story - as the ones of de Forest and Farnsworth - is yet another illustration on the role of gifted mechanics and ham radio enthusiasts in the development of the Bay Area's early electronics industry. It seems that the best results were achieved when such practical mechanical brilliance was wedded to advanced technical training and theoretical knowledge.

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Some of the early spin-offs

Only one year after its founding, FTC produced its first spin-off. Three of its employees left the company in 1910 to start a research and development firm in a garage in Napa. By 1913 they had patented the "moving coil" loudspeaker, which was a vast improvement over existing speakers. By 1917 they had perfected a design that most loudspeakers are still based on today. They named their company Magnavox, now a subsidiary of Philips.

Key components of Dalmo-Victor's radar antenna system were two small precision electric motors to aim the device and a tiny generator to supply power. Motors and generators of this sort were unavailable on the open market at this time. Dalmo-Victor itself encouraged the creation of a company to manufacture them, whic was called Ampex, and later went on to develop multitrack recording, the first video tape recorder, and tape backup drives for large computer systems.

Frederick Terman

Under Frederick Terman, son of an eminent Stanford psychologist, Stanford university became the leading academic center for radio research on the West Coast. When Terman returned to Stanford in 1925 with his MIT doctorate, he promptly launched an aggressive, commercially oriented program in radio electronics. Taking a lesson from MIT, he talked companies into donating the equipment, drew his research problems directly from industry, and to keep his students up to date, arranged field trips to local electronics companies.

One of the famous spin-offs of that time is Hewlett-Packard (HP), founded by Stanford University classmates Bill Hewlett and Dave Packard 1939. The company's first product, built in a Palo Alto garage, was an audio oscillator - an electronic test instrument used by sound engineers. One of HP's first customers was Walt Disney Studios, which purchased eight oscillators to develop and test an innovative sound system for the movie Fantasia. In 2004 HP held Fortune 500 ranking 11 !

Terman spend World War II directing the Radio Research Laboratory (RRL), a spin-off of MIT's Radiation Laboratory devoted to radar countermeasures. He brought along a number of Stanford students and colleagues (thirty in all), and together they received a practical education in the art of microwave engineering. Terman returned to Stanford in 1946 with a core of electronics veterans from RRL, a new title - dean of engineering - and a new vision of Western industrial leadership. As he explained to the university’s president : “Government-sponsored research presents Stanford, and our School of Engineering, with a wonderful opportunity if we are prepared to exploit it !”

The klystron

Stanford played a key role in fostering the klystron, perhaps the most important electronics innovation developed on the West Coast before World War II. In 1937 the Varian brothers, working with several Stanford physicists, invented the klystron, an original and extremely flexible microvawe receiver and transmitter. Under an unusual contract with the university, the Varians were granted access to faculty, laboratory space, and modest funding for materials in

return for a half-interest in any resulting patents. A subsequent agreement between the university and Sperry Gyroscope Company provided substantial corporate funding for klystron research and development at Stanford.

When the Varian brothers founded Varian associates in 1948 to design and manufacture klystrons and other advanced microwave tubes, the company literally got its start at Stanford. Its first board meeting was held on campus, its board of directors included several faculty members, and its first successful product was designed by a faculty consultant. The Korean War transformed Varian into big business, and the company strenghtened its ongoing ties to the university by signing on an as the first tenant of the Stanford Industrial Park formed in 1951, negotiating a long-term lease on university-owned land just south of campus for its research laboratories and its expanding tube department. When Fairchild Semiconductors was still just Robert Noyce and a few bright young engineers, it led the Under Secretary of Commerce to call Santa Clara County the “microwave capital” of the world.

Semiconductors, and the venture capital industry

The San Francisco Bay Area and semiconductors were not always synonymous. Silicon Valley's capture of the semiconductor industry is the result of a series of small events that would make an enormous difference. In 1955, William Shockley, co-inventor of the transistor at Bell Laboratories, decided to establish a firm to exploit his invention. To launch a firm, he needed capital, which he could not secure back East. After these failures he was introduced to Arnold Beckman, the founder of Los Angeles-based Beckman Instruments; Beckman agreed to fund Shockley to start a firm in Palo Alto.

Shockley hired eight brilliant young scientists and engineers and brought them with him to Palo Alto. Shockley proved to be difficult to work with, and the eight resigned in 1957 to form their own start-up. Named Fairchild Semiconductor this company quickly became a technological leader in the transistor industry and spearheaded the transition to the integrated circuit. With the Sputnik-related military buildup throughout the 1960s and the adoption of transistors and integrated circuits by the manufacturers of consumer electronics and computers, sales boomed and profits were exorbitant. This had many firm founders and early employees becoming very wealthy. Their success, and willingness to invest in new ventures, put in motion a path-dependent logic, in terms of an example and an incentive for others to follow. The dimensions of this spin-off process were immense : a genealogy of semiconductor start-ups through 1986 indicated that 124 start-ups could trace their roots to Fairchild, such as Intel, AMD, National Semiconductor, LSI Logic, etc.

Fairchild and its spin-offs were equally important in the history of Silicon Valley venture capital. In addition to Arthur Rock, who arranged the Fairchild investment in 1958, organized the funding for Intel, and provided funding to many other start-ups (such as Apple and Scientific Data Systems), other important venture capitalists who began their career at Fairchild are Donald Valentine and Pierre Lamond of Sequoia Partners, and Eugene Kleiner of Kleiner Perkins.

A final contribution of Fairchild and its early start-ups was a number of managers and engineers that had become independently wealthy and were able to invest in or join start-ups without risking their financial future - in other words, the labor power was being freed to join

new firms. The lessons to entrepreneurs and investors was that all key employees must share in the wealth created by their activities. Equity participation and stock options became the vehicles of choice for compensating and retaining key employees.

IBM Almaden Research Center

One of the critical institution for Silicon Valley's success was the electronics research center that IBM located in San Jose in 1952, with the goal to secure access to talented West Coast engineers unwilling to relocate to its East Coast laboratories. The San Jose / Almaden laboratory had IBM's global mandate for magnetic storage device manufacturing. The development of the Winchester disk drive led to the formation of a multibillion-dollar industry in Silicon Valley. Many other innovations were developed in IBM's research laboratory and commercialized by its employees, responsible for the founding of Memorex and other well-known disk drive and peripheral firms such as Shugart, Seagate, Adaptec, Maxtor and Quantum.

The IBM Almaden laboratory also developed the technology for relational databases. But, as was typical for IBM in the early 1980s, commercialization was slow. This provided an opportunity for Larry Ellison to establish Oracle, which is now among the largest independent software companies in the world. With the other Silicon Valley relational database start-ups, Sybase and Informix, and IBM, the San Francisco Bay Area has the largest concentration of relational database software companies in the world. Drawing upon this strength, a number of data warehousing and database mining software firms have also been created in Silicon Valley.

Xerox Palo Alto Research Center

Of all the corporate research laboratories in Silicon Valley, Xerox’s Palo Alto Research Center (PARC) has received the most attention and probably contributed the most to Silicon Valley. Xerox established PARC in 1970 in proximity to Stanford and burgeoning Silicon Valley semiconductor and computer industry, with the express mission of conducting the basic research necessary to develop the “office of the future”. In the 1970s, PARC pioneered many of the technologies defining computing in the 1990s, including graphical user interfaces, local area networks (Ethernet), desktop workstations, the computer mouse, and a host of others. Although Xerox proved incapable of commercializing these new technologies, it helped companies like Apple Computers and (Swiss based) Logitech to bring innovative products on the market.

The more recent history

The more recent history of the San Francisco Bay Area is equally fascinating, and could fill a chapter by itself. By the early 1970s the entire area was filled with semiconductor companies, computer firms using their devices, and programming and service companies serving both. Industrial space was plentiful and housing was still inexpensive. The growth was fueled by the emergence of the venture capital industry on Sand Hill Road, in Menlo Park.

The semiconductor industry created the foundations for the next "wave" of successes for Silicon Valley, with the computer, PC and workstation industry. In fields like hardware (Apple, Sun Microsystems, Silicon Graphics, etc.), software (Adobe, Claris, Intuit, PeopleSoft, Siebel Systems, Symantec, Veritas, etc.), peripherals (Hewlett-Packard, Logitech, etc.), networking (Cisco Systems, Juniper Networks, etc), manufacturing (Solectron, etc.), many of the Fortune 500 companies are headquartered in the Bay Area. San Jose State University and Santa Clara University educate the skilled technical workers needed.

The last "wave" - still fresh in all memories - is the development of the Internet and the World Wide Web (although the Web was actually invented at CERN, in Geneva). Silicon Valley global companies and brands like Google, eBay, or Yahoo! are their icons. Their history is written every day !

There is more than just silicon

The San Francisco Bay Area was the birthplace of biotechnology in the 1970's with the discovery that DNA could be cloned. Today, the region is clearly the national leader in biomedical research. More than 800 companies throughout the Bay Area provide more than 85,000 jobs in bioscience directly (for a total of about 230'000 in California). In North America, the region holds first rank in market capitalization (24% of total), venture capital investment (34% of total) and grants from the National Institutes of Health (NIH). In 2003 venture capital investment in life sciences outpaced investment in all other industry sectors.

Estimates predict that by 2010, the biotech industry will grow by nearly 30 percent. Some of the biggest biotech names in the San Francisco Bay Area have very strong links to Switzerland : Genentech, Chiron, Roche Bioscience. Other industry leaders include Gilead Sciences, Bayer, Berlex, Applied Biosystems, Exelixis, Genencor, Incyte. The academic environment in biosciences is lead by University of California in San Francisco, University of California in Berkeley, Stanford University, among many others.

It would be an over-simplification not to mention the many other competences of the Bay Area's universities, research laboratories, companies and other institutions. There is the sophisticated knowledge needed in the investment banking and venture capital businesses, which created here the world's highest concentration of venture capitalists, and has Silicon Valley’s share of national venture capital investment continuously growing to reach 35% in 2004.

There are all the environmental competences in an area where activism for a more sustainable world has a long tradition. There is energy research with such institutions as EPRI, the Electrical Power Research Institute established in 1973, and whose clients represent over 90% of the electricity generated in the USA. There is nanotechnology - a field named in the 1980s by theorist Eric Drexler, the founder of the Foresight Institute in Palo Alto - in which the Bay Area has a leading role nationwide. And there is the cross-fertilization between information technologies, life sciences, environmental research and nanotechnology, which might lead to the next "Big Thing", as people here like to call it !

Swiss presence

The San Francisco Bay Area has attracted and continues to attract talents, pioneers and entrepreneurs from all over the world, including many from Switzerland. Three stories shall illustrate the contributions of Swiss expatriates to innovation.

In the early sixties, Doug Engelbart, Bill English and Stuart Card from Xerox Palo Alto Laboratory (PARC) and Stanford Research International (SRI) were exploring ways to improve the interactions of humans with computers, and developed the first computer mouse. At about the same time, ETHZ Professor Niklaus Wirth spent two years at PARC, became an enthusiastic user of the mouse, and brought it back to Zurich for use on his workstations Lilith and Ceres. It was Prof. Jean-Daniel Nicoud at the Ecole polytechnique fédérale de Lausanne (EPFL) who then miniaturized the mouse and did the first steps towards industrial production. Eventually, it was Daniel Borel (an EPFL alumni and Stanford graduate) and his partners who started mass-manufacturing the mouse, and later contineously improved it, leading their Swiss-based Logitech to become the worldwide reference for man-machine interfaces.

Silicon Valley is well-known for its efficiency at bringing ideas to market, at transforming discoveries into products. It is also a unique pool of early adopters of new technologies. Not surprisingly therefore the San Francisco Bay Area is also home of some of the most innovative design companies like Ideo and Frog Design. In recent years they have been joined by fuseproject, a product and branding design company founded and led by Yves Béhar, a native of La Tour-de-Peilz and graduate of Pasadena's Art Center College of Design. Yves Béhar not only works with prestigious companies in the computer, car, perfume, and shoe industries among others, he already had two exhibitions at the San Francisco Museum of Modern Art, and won the prestigious National Design Award for product design in 2004. Yves also designed the visual and spatial identity for swissnex.

Sergio Magistri holds a degree in electrical engineering and a doctorate in biomedical engineering from the Swiss Federal Institute of Technology in Zurich. He joined Invision Technologies in 1992, two years after the company was founded with the mission to develop, manufacture, market and service explosive detection systems (EDS) based on advanced computer tomography X-ray technology. Two years later, the company introduced the first EDS meeting the stringent Federal Aviation Authority certification requirements. But sales stalled throughout the mid 90's due to a lack of demand for such sophisticated machines. The world changed overnight on Sept. 11, 2001 : today InVision holds a dominant market position and was ranked by Fortune magazine in 2003 among the 100 fastest growing companies in America. Sergio Magistri himself was named 2003 Ernst & Young entrepreneur of the year, and by end of 2004 sold the company to General Electric for 900 million dollars, in what is a true American success story.

The Swiss Science and Technology Office (SSTO)

It is in this unique, dynamic and innovative environment that in 1997 Switzerland decided to post its fifth science & technology counselor, after Washington, Tokyo and Brussels. As Dr. Christian Simm was the first Swiss counselor not to work in a national capital, expectations for a non-traditional outcome of his activities were as high as his work environment was not outlined : his office at the Consulate General of Switzerland had neither Internet connection,

nor computer !... But this was also one of the attractors of this position : being able to shape it the "Silicon Valley way", to move it into Internet age, and to invent new ways to foster knowledge exchange between Switzerland and Western North America.

SwissTalents (www.swisstalents.org), the network of highly skilled expatriated professionals who are Swiss or have strong ties to Switzerland, was started in 1999 by the SSTO to use the Web's potential to create an international community of competences. SwissTalents members not only can network among themselves and be identified as specialists in their field by others, they are kept informed about science and innovation made in Switzerland by means of a quarterly magazine and an electronic newsletter.

The next step was the setup of "Science-Switzerland" and "Science-America", two electronic newsletters aiming at improving the mutual knowledge exchange between the two countries. This concept was later enlarged, as tools like "Science-Europe" and "Science-Asia" were offered to the growing network of Swiss science & technology counselors, and as "eJobs" helped public institutions in Switzerland to promote their open positions.

The SSTO in San Francisco was also the first to launch its own website (www.sciencelink.org), on which carefully collected, selected and edited information - like a list of Swiss start-ups and a directory of relevant institutions in Western North America - is offered. However the work of the (mostly) one-person office was by far not limited to the Internet. Visits of numerous delegations - including former Swiss presidents Arnold Koller and Kaspar Villiger, State Secretary Charles Kleiber, the ComCom (the Swiss FCC) and several Swiss Nanotechnology Roadshows - as well as the organization of many public events started to put the office "on the map". Most of these events were impassioning, even for a wider audience : "The Search of Other Worlds" with Didier Queloz, the co-discoverer of the first exo-planet, "American and Swiss Perspectives on Entrepreneurship and Venture Capital" with a superb panel of specialists from both sides of the Atlantic, or "Serendipity in Scientific Research" with Nobel-laureate Edmond Fischer, for instance. The last highlight before the SSTO “reinvented itself” was the 2003 annual meeting of the network of Swiss science & technology counselors, which drew more than 25 participants from Swiss institutions and around the world.

swissnex

Soon after his arrival in San Francisco in 1997, it became obvious to Christian Simm, the science & technology counselor, that there was an untapped potential for synergies between various organizations already present or planning to open an office in the Bay Area, organizations all active in a bridging function between Switzerland and the West Coast. Not only could they improve their sharing of information and experience, their exchange of contacts, their cooperation on specific subjects, they all lacked visibility.

The concept was clear : encourage government, research laboratories, universities, and private sector to join forces. The implementation of this bottom-up initiative though was to be a challenge, as it had never been done in that format before, as there was no how-to-do-it manual and much reticence over the unknown, and as many political, administrative and cultural hurdles had to be overcome. But on Nov. 14, 2003, the result of all these efforts was officially inaugurated in the presence of a large VIP delegation from Switzerland including

State Secretaries Charles Kleiber and Franz von Däniken, and celebrated the same night in a party that will long be remembered !

"swissnex" was the name chosen for this initiative - where "nex" stands for "nexus", "next to" or "next" - to symbolize the active role it wants to play at many crossroads, between Switzerland, Western North America, science, technology, higher education, art and innovation. It is an initiave of the Swiss State Secretariat for Education and Research, managed in cooperation with the Department of Foreign Affairs, with a strong support from the private sector (from SwissRe and the Oltramare Foundation among others). swissnex (www.swissnex.org) is headquartered in a beautiful historic building at 730 Montgomery, just a few blocks from the Consulate General of which it is legally an annex. swissnex offers eighteen workspaces, and currently hosts representatives of six different organizations : the former SSTO which also manages the initiative, the Swiss Federal Institute of Technology in Zurich (ETHZ), two technology outposts, the economic promotion for the Greater Zurich Area, and two entrepreneurs in residence supported by the Commission for Technology and Innovation (CTI).

And swissnex's slogan is as simple as it is descriptive : "connect the dots" !

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